

# Chih-wen Weng (翁志文)- Curriculum vita

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- **Research Interests**

Algebraic Combinatorics.

- **Education**

B.S. in Mathematics, National Taiwan University, June 1986.

Ph.D. in Mathematics, University of Wisconsin, Madison, U.S.A., August 1995, Advisor: Paul M. Terwilliger.

- **Positions**

Associate Professor, Department of Applied Mathematics, National Chiao Tung University, August 1995 -January 2002.

Honorary Fellow, Department of Mathematics, University of Wisconsin, Madison, July 2000-December 2000.

Professor, Department of Applied Mathematics, National Chiao Tung University, January 2002- January 2021.

Chair, Department of Applied Mathematics, National Chiao Tung University, August 2013- July 2016.

Panel Member of Mathematics Division, National Science Council, January 2014-December 2014.

Panel Member of Mathematics Division, Ministry of Science and Technology, January 2015-December 2016.

Associate Dean, College of Science, National Chiao Tung University, August 2018-January 2021.

Convener, Teaching Improving Group of Foundation in Science, National Chiao Tung University, August 2019-July 2021.

Acting Dean, College of Science, National Yang Ming Chiao Tung University, February 2021-July 2021.

- **Research Activity**

- 2022/1/26, Sharp bounds of the  $A_\alpha$ -spectral radius of mixed trees, Workshop on Algebraic Combinatorics-Institute of Mathematics, 中研院, 2022/1/24-26
- 2021/1/18, An Introduction to Hamiltonian Graph Theory, NCTS Winter School-Six Aspects of Combinatorial Mathematics, 台北, 2021/1/18-22.

- 2019/11/17, Hamiltonian and 1-tough properties in Cartesian product graphs, 6th-ITCDM 2019, IIT (BHU) Varanasi, Inida, 2019/11/15-18.
- 2019/6/21, On degrees and average 2-degrees in graphs, International Conference on Graph Theory, Combinatorics and Applications, 中山大學, 2019/6/17-21.
- 2019/2/23, The largest real eigenvalues of nonnegative matrices by applying Kel-mans transformations, 2019 Taipei International Workshop on Combinatorics and Graph Theory, 中研院, 2019/2/20-23.
- 2018/9/11, A conjecture on the spectral radius of a bipartite graph, 2ND INTERNATIONAL CONFERENCE ON PURE AND APPLIED MATHEMATICS, Van Yüzüncü Yıl University, 2018/9/11-13.
- 2018/8/3, On bipartite graphs analog of the Brualdi-Hoffman conjecture, 2018 組合與圖論研討會, 中研院, 2018/8/2-4.
- 2017/7/19, Spectral bounds obtained by reweighting entries in a row of a nonnegative matrix, 5th ITCDM 2017, 淡江大學, 2017/7/18-21.
- 2015/12/10, An extending result on spectral radius of bipartite graphs, 2015 Workshop on Spectral Graph Theory and Its Applications, 交大, 2015/12/9-10.
- 2015/7/16, Degree Pairs of a Graph, International Conference on Graph Theory and its Application, Pondicherry India, 2015/7/15-16.
- 2015/7/11, Quasi-spectral characterizations of graphs, The Fourth India-Taiwan Conference on Discrete Mathematics, Chennai India, 2015/7/10-13.
- 2015/6/30, The degree pairs of a graph, 2015 年圖論與組合學國際研討會暨第八屆海峽兩岸圖論與組合學研討會, 2015/6/27-30.
- 2013/12/7, Spectral Radius and Degree Sequence of a Bipartite Graph, 2013 年數學年會, 高雄中山大學, 2013/12/6-8. 2013/8/19, Spectral Graph Theory and Its Applications, 2013 組合新苗研討會, 高雄師範大學, 2013/8/10-11.
- 2013/7/12, Spectral characterization of graphs, 2013 International Conference on Combinatorics, 交大, 2013/7/11-12.
- 2013/6/28, Spectral characterization of graphs, 第七屆海峽兩岸圖論與組合會議, 湖南師範大學, 2013/6/28-30.
- 2013/5/11, A characterization of bipartite distance-regular graphs, 2013 南區組合數學研討會, 中山大學, 2013/5/11.
- 2012/8/19, A few inequalities related to spectral excess theorem, 2012 Shanghai Conference on Algebraic Combinatorics, 上海, 8/17-22, 2012.
- 2011/12/17, Inequalities Related to Spectral Graph Theory, 編碼相關理論及其應用研討會 (2011)-19, 高雄義守大學, 2011/12/17-18.
- 2011/9/10, The spectral excess theorem for general graphs, Second India-Taiwan Conference on Discrete Mathematics, Coimbatore(孔巴托), September 8-11, 2011.
- 2011/6/29, D-bounded property in a distance-regular graph +hs, 2011 Conference on Graph Theory and Combinatorics and Sixth Cross-strait Conference on Graph Theory and Combinatorics, National Chiao Tung University, June 27-30, 2011.
- 2011/5/20, Reeder's puzzle on a tree, The International Conference on Designs, Matrices and Enumerative Combinatorics, Academia Sinica, 2011/5/19-22.

- 2010/8/7, Lit-only sigma-game and its dual game on a graph, 2010 Workshop on Combinatorics, National Taiwan University, 2010/8/7-8.
- 2010/7/12, Pooling designs with d-disjunct property and block weight d+1, Algebraic and Geometric Combinatorics conference 2010, Gyeongju, South Korea, 2010/7/12-16.
- 2009/12/6, Pooling design and its construction, 2009 Mathematical Meeting and Annual Meeting of the Mathematical Society of ROC, National Chung Cheng University, 2009/12/4-6.
- 2009/11/10, D-bounded distance-regular graphs, India-Taiwan Conference on Discrete Mathematics, National Taiwan University, 2009/11/9-12.
- 2009/7/30, The Lit-Only Sigma Game on a Simple Graph, Fourth Cross-strait Conference on Graph Theory and Combinatorics, Tinjin China, 2009/7/29-31.
- 2009/7/28, Nontrivial Pooling Designs, visiting Peking Normal University, 2009/7/24-28.
- 2009/2/10, The Flipping Puzzle on a Simple Graph, Korea-Japan Workshop on Algebra and Combinatorics, Pusan, 2009/2/8-10.
- 2009/2/12, The D-bounded Property on a Distance-regular Graph with  $a_1 = 0$ ,  $a_2 \neq 0$ , visiting POSTECH, 2009/2/11-13.
- 2008/8/20, The Flipping Puzzle on a Graph, Geometric and Algebraic Combinatorics 4, Oisterwijk, The Netherlands, 2008/8/ 17-22.
- 2007/6/27, Regular Graphs with Four Eigenvalues, 2007 International Conference on Graph Theory and Combinatorics and Fourth Cross-strait Conference on Graph Theory and Combinatorics, Taipei (NTU), 2007/6/24-29.
- 2007/6/7, Construct Pooling Designs from Hermitian Forms Graphs, International Workshop on Combinatorics 2007, Keio University Yagami Campus (June 6-8), Kyoto University Yoshida Campus (June 10-14), Japan.
- 2006/12/10, The q-analogue Problems in Different Aspects, 2006 Mathematical Meeting and Annual Meeting of the Mathematical Society of ROC, Taipei.
- 2006/6/26, Triangle-free Distance-regular Graphs, Algebraic Combinatorics, An International Conference in Honor of Eiichi Bannai's 60th Birthday, Sendai, Japan.
- 2005/6/28, More Examples of Pooling Spaces, 2005 International and Third Cross-strait Conference on Graph Theory and Combinatorics, Jinhua, China, 2005/6/26-30.
- 2004/7/21, Bidiagonal Triples and the Quantum Group  $U_q(sl_2)$ , Com2MaC Conference on Association Schemes, Codes and Designs, Pusan, Korea, 2004/7/19-23.
- 2003/11/20, An inequality for regular near polygon graphs, The Second East Asian Conference on Algebra and Combinatorics, Fukuoka Japan, 2003/11/17-21.
- 2001/9/14, Pseudo Idempotents and Modules with Endpoint One in a Terwilliger Algebra, East Asian Conference on Algebra and Combinatorics, Taipei (NTU), 2001/9/11-14.

- 2001/6/25, Pseudo Idempotents in Distance-Regular Graphs, CAS International Conference on Graph Theory and Combinatorics and First Mainland-Taiwan Joint International Conference on Graph Theory and Combinatorics, Kunming China, 2001/6/22-26.
- Workshop on Algebraic Combinatorics, NCTU(1995/5/5-6), NCTU (1998/6/4-5), PTIC (1998/10/16-17), ISU (1999/4/17-18), NCTU (1999, December), Taiwan.
- Meeting on Algebraic Combinatorics, Kyoto, Japan, December 1995.
- Special Session on Algebraic Combinatorics, Meeting of the AMS, College Station, TX, October 1993.

## • Publications

### **Combinatorial Matrix Theory**

- \* Yen-Jen Cheng, Chia-An Liu, Chih-wen Weng, Counterexamples of the Bhattacharya-Friedland-Peled conjecture, *Linear Algebra and its Applications*, 641 (2022), 200-207.
- \* Louis Kao and Chih-wen Weng, A Note on the Largest Real Eigenvalue of a Non-negative Matrix, *Applied Mathematical Science*, Vol. 15, 2021, no. 12, 553-557, <https://doi.org/10.12988/ams.2021.914558>
- \* Yen-Jen Cheng, Feng-lei Fan and Chih-wen Weng, An extending result on spectral radius of bipartite graphs, *Taiwanese Journal of Mathematics*, 22(2)(2018), 263-274.
- \* Chia-an Liu, Chih-wen Weng, Spectral characterizations of two families of nearly complete bipartite graphs, *Annals of Mathematical Sciences and Applications*, 2(2), 241-254, 2017.
- \* Feng-lei Fan and Chih-wen Weng, A characterization of strongly regular graphs in terms of the largest signless Laplacian eigenvalues, *Linear Algebra and its Applications*, 506, 1-5, 2016.
- \* Fan-Hsuan Lin and Chih-wen Weng, A bound on the Laplacian spread which is tight for strongly regular graphs, *Linear Algebra and its Applications*, 494, 11-22, 2016.
- \* Chia-an Liu, Chih-wen Weng, Spectral radius of bipartite graphs, *Linear Algebra and its Applications*, 474, 30-43, 2015.
- \* Yu-pei Huang and Chih-wen Weng, Spectral Radius and Average 2-Degree Sequence of a Graph, *Discrete Mathematics, Algorithms and Applications* Vol. 6, No. 2, 1450029 (9 pages), 2014.
- \* Chia-an Liu and Chih-wen Weng, Spectral radius and degree sequence of a graph, *Linear Algebra and its Applications*, 438, 8, 3511-2515, 2013
- \* Wei, P., Weng, C., A Typical Vertex of a Tree , *Discrete Math*, 226:337-345, 2001.

### **Distance-regular graphs**

- \* Yu-pei Huang, Yeh-jong Pan and Chih-wen Weng, Nonexistence of a Class of Distance-Regular Graphs, the electronic journal of combinatorics, Volume 22, Issue 2, #P2.37, 2015

- \* Guang-Siang Lee and Chih-wen Weng, A characterization of bipartite distance-regular graphs, *Linear Algebra Appl.*, 446, 91-103, 2014.
- \* Guang-Siang Lee and Chih-wen Weng, A spectral excess theorem for nonregular graphs, *Journal of Combinatorial Theory, Series A* 119, 1427-1431, 2012.
- \* Yeh-jong Pan and Chih-wen Weng, A note on triangle-free distance-regular graphs with a pentagon, *Journal of Combinatorial Theory, Series B*, 99, 266-270, 2009.
- \* Yeh-jong Pan and Chih-wen Weng, Three bounded properties in triangle-free distance-regular graphs, *European Journal of Combinatorics*, 29, 1634-1642, 2008.
- \* Yeh-jong Pan, Min-hsin Lu and Chih-wen Weng, Triangle-free Distance-regular Graphs, *Journal of algebraic combinatorics*, 27(1), 23-34, 2008.
- \* Terwilliger, P. and Weng, C., An inequality for regular near polygons, *European Journal of Combinatorics* 26, 227-235, 2005.
- \* Terwilliger, P. and Weng, C., Distance-regular graphs, pseudo primitive idempotents, and the Terwilliger algebra, *European J. Combin.* 25, 287-298, 2004.
- \* Weng, C., Classical Distance-Regular Graphs of Negative Type, *Journal of Combinatorial Theory Series B*, 76: 93-116, 1999.
- \* Weng, C., Weak-geodetically Closed Subgroups in Distance-Regular Graphs, *Graphs and Combinatorics*, 14: 275-304, 1998.
- \* Liang, Y. and Weng, C., Parallelogram-Free Distance-Regular Graphs, *Journal of Combinatorial Theory Series B*, 231-243, 1997.
- \* Weng, C., D-bounded Distance-Regular Graphs, *European Journal of Comb.* 18, 211-229, 1997.
- \* Weng, C., Kite-Free P- and Q-Polynomial Schemes, *Graphs and Combinatorics*, 201-207, 1995.

### **Pooling Designs**

- \* Jun Guo, Kaishun Wang, Chih-wen Weng, Pooling semilattices and non-adaptive pooling designs, *Discrete Mathematics* 320, 64-72, 2014.
- \* Tayuan Huang, Kaishun Wang and Chih-wen Weng, A Class of Error-Correcting Pooling Designs over Complexes, *Journal of Combinatorial Optimization*, 19: 486-491, 2010.
- \* Hau-wen Huang, Yu-pei Huang and Chih-wen Weng, More on Pooling Spaces, *Discrete Mathematics* 308:6330-6338, 2008.
- \* Tayuan Huang, Kaishun Wang and Chih-wen Weng, Pooling spaces associated with finite geometry, *European Journal of Combinatorics*, 29(2008) 1483-1491.
- \* A. G. D'yachkov, Frank K. Hwang, A. J. Macula, P. A. Vilenkin and Chih-wen Weng, A Construction of Pooling Designs with Some Happy Surprises, *Journal of Computational Biology*, 12(8), 1127-1134, 2005.
- \* Tayuan Huang and Chih-wen Weng, Pooling Spaces and Non-Adaptive Pooling Designs, *Discrete Mathematics*, 282(1-3), 163-169, 2004.

- \* Tayuan Huang and Chih-wen Weng, A note on decoding of superimposed codes, Journal of Combinatorial Optimization, 7, 381-384, 2003.

### **Presentation and Representation Theory**

- \* Hau-wen Huang and Chih-wen Weng, The edge-flipping group of a graph, European Journal of Combinatorics, 31:1567-1578, 2010.
- \* Hau-wen Huang and Chih-wen Weng, The flipping puzzle on a graph, European Journal of Combinatorics, Volume 31, Issue 3, April, Pages 932-942, 2010.
- \* Ito T., Terwilliger P. and Weng C., The quantum algebra  $U_q(\mathfrak{sl}_2)$  and its equitable presentation, Journal of Algebra 298 (2006) 284-301.

### **Others**

- \* Shih, C. and Weng, C., On the Templates Corresponding to Cycle-Symmetric Connectivity in Cellular Neutral Networks, International Journal of Bifurcation and Chaos, 12:2957-2966, 2002.
- \* Shih, C., Weng, C. Cycle-Symmetric Matrices and Convergent Neutral Networks, Physical D, 146:213-220, 2000.